

What is Claimed is:

- 1 1. A system for reducing noise in a wideband signal having at least one narrow frequency  
2 component comprising:  
3 a filterbank comprising a first filter having a first frequency and a first output and a  
4 second filter having a second frequency and a second output, wherein the phases of said first  
5 frequency and said second frequency differ by 180 degrees about a third frequency;  
6 a running cross-correlator interconnected to said first filterbank for comparing said first  
7 output of said first filter and said second output of said second filter; and  
8 an analysis-synthesis filterbank for attenuating said wideband signal at said third  
9 frequency in response to said running cross-correlator.
- 1 2. The system of claim 1, further comprising first and second saturating non-linearity  
2 components interconnecting said first filter and said second filter, respectively, to said running  
3 cross-correlator.
- 1 3. The system of claim 2, wherein said first and second saturated non-linearity components  
2 are signum functions.
- 1 4. The system of claim 1, wherein said running cross-correlator comprises a cross-correlator  
2 interconnected to a low-pass filter.
- 1 5. The system of claim 1, wherein said second filterbank attentuates said third frequency only  
2 when said running cross-correlator has a reduced response.

- 1 6. A method for reducing noise in a wideband signal, comprising the steps of:
- 2 (a) filtering said wideband noise at a first frequency to produce a first filter output;
- 3 (b) filtering said wideband noise at a second frequency to produce a second filter
- 4 output, wherein the phases of said first frequency and said second frequency differ by 180
- 5 degrees about an intermediate third frequency;
- 6 (c) performing a running cross-correlation of said first filter output and said second
- 7 filter output; and
- 8 (d) attenuating said wideband signal at said third frequency according to said running
- 9 cross-correlation.
- 1 7. The method of claim 6, further comprising the step of transforming said first filter output
- 2 and said second filter output with a saturated non-linearity component function prior to
- 3 performing said running cross-correlation.
- 1 8. The method of claim 6, further comprising the step of amplifying said wideband signal at
- 2 said third frequency if said running cross-correlation has a low value.

1 9. The method of claim 6, further comprising the steps of  
2 (a) filtering said wideband noise at a fourth frequency to produce a fourth filter  
3 output;  
4 (b) filtering said wideband noise at a fifth frequency to produce a fifth filter output,  
5 wherein the phases of said fourth frequency and said fifth frequency differ by 180 degrees at an  
6 intermediate sixth frequency;  
7 (c) performing a running cross-correlation of said saturated fourth filter output and  
8 said saturated fifth filter output; and  
9 (d) attenuating said wideband signal at said sixth frequency according to said running  
10 cross-correlation.

1 10. The method of claim 9, further comprising the step of combining the attenuated signals of  
2 steps (d) and (j).

1 11. The method of claim 6, wherein the step of attenuating said wideband signal at said third  
2 frequency according to said running cross-correlation comprises passing said wideband signal  
3 through an analysis-synthesis filterbank.